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RAPID SOLIDIFICATION TECHNOLOGY WORKSHOP

FINAL REPORT

PREPARED FOR:

Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ont.
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MICROMEDIA

BACKGROUND

Rapid Solidification is a new Technology which is being investigated for its industrial potential, not only in Canada but also, in other major industrialized countries. For this reason, Energy, Mines and Resources, Defence Research Establishment Atlantic and Ontario Research Foundation, cooperated in arranging a National Workshop to stimulate interest in Rapid Solidification Technology (RST) and to catalyze some industrial action.

OBJECTIVES

The specific objectives of this workshop were to:

1) Review the effects of rapid solidification on the structure and properties of materials.

2) Exam[illegible]ious techniques of rapid solidification and their applic[illegible]n.

3) Increase industrial awareness of facilities, projects and applications involving RST, in Canada.

WORKSHOP

The Workshop was held at the Sheridan Park Conference Centre, Mississauga, on the 25th October, 1984.

Preliminary notices and Registration forms were mailed to over 100 companies, Universities and Government Agencies across Canada, prior to the Workshop. Copies of these items are included in Appendix I. At the time of mailing the Registration Forms, the names of those reporting on Canadian activities in RST had not been confirmed. However, they appear in the program issued on the day of the Workshop (ref. Appendix II).

Of the major speakers, Professor N.J. Grant of the Massachusetts Institute of Technology and Dr. C. Ashdown of Metallurgical Instruments Inc. reviewed the effects of rapid solidification on the structure and properties of materials, with particular emphasis on crystalline and microcrystalline materials.

Professor Grant, a well known authority on the subject, emphasized that RST is still a new field of activity and that it might be entitled, more correctly, "Structure Control" Technology.

Dr. R.E. Maringer of Battelle Memorial Institute, one of the leaders in the development of rapid solidification techniques, gave an overview of the status of rapid solidification processing. On the other hand, Mr. N. Dicristofaro of Allied Corporation described the METGLAS plant in which Allied produces amorphous metal sheet for transformer applications and discussed potential applications of metallic glasses.

Although RST is relatively new to Canada, there is a growing interest in the subject. This was illustrated by Mr. W. M. Gibbon of ORF, Mr. M. Ruscoe of Sherrit Gordon Mines Ltd., Professor J.O. Strom-Olsen of McGill University, Mr. J. Kortschinski of Ontario Hydro and Dr. K.N. Tandon of Manitoba Research Council, who reported on some of the facilities, projects and applications involving RST in Canada.

A total of 35 people, excluding the invited speakers, attended the Workshop. They represented 20 organizations which are either active or interested in becoming active in RST. Several other organizations, known to be interested in RST, were unable to send personnel to the Workshop, for various reasons. The list of attendees is included in Appendix III.

CONCLUSIONS

The objectives of the RST Workshop were met fully. The effects of rapid solidification were reviewed and techniques examined by recognized experts in the subject, and descriptions given of relevant Canadian activities. In all, the Workshop represented the greatest concentration of RST knowledge, expertise and interest assembled in Canada to date and as such should serve to stimulate further activity in the Canadian Industrial and Scientific communities.

Although current Canadian activities in RST do not warrant holding a workshop annually, consideration should be given to repeating the exercise in approximately 2 years' time.

W.M. Gibbon, P.Eng.
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Materials Division

WORKSHOP ON RST: AN ADVANCED TECHNOLOGY FOR CANADIAN INDUSTRY

Sheridan Park Conference Centre
Mississauga, Ontario

October 25, 1984

PROGRAM

8:45 a.m.	WELCOME Paul Midghall, President ORF
9:00	SESSION I: CRYSTALLINE MATERIALS Chairman: D.W.G. White, Energy, Mines & Resources Canada
9:05	Properties of Rapidly Solidified Crystalline Materials N.J. Grant, Massachusetts Institute of Technology
10:00	RST Research Activities at the Ontario Research Foundation W.M. Gibbon, Ontario Research Foundation
10:20	Coffee
10:40	Status of Rapid Solidification Processing R.E. Maringer, Battelle Memorial Institute
11:40	RST at Sherritt Gordon M. Ruscoe, Sherritt Gordon Mines Ltd.
12:00	LUNCH

1:30 p.m. SESSION II: METALLIC GLASSES

Chairman: R.S. Hollingshead, Defence Research Establishment Atlantic

1:35 Technology of Amorphous Glasses
N. Dicristofaro, Allied Corp.

2:30 Why Should a Physicist be Interested in Metallic Glasses?
J.O. Strom-Olsen, McGill University

2:50 Microcrystalline Alloys
C. Ashdown, Metallurgical Instruments, Inc.

3:20 The Canadian Electrical Association's Participation in the Development of Metallic Glass Transformers
J. Kortschinski, Ontario Hydro

3:40 Applications of Metallic Glasses
K.N. Tandon, Manitoba Research Council

4:00 Concluding Remarks
L.E. Collins, Energy, Mines & Resources Canada

ATTENDANCE LIST

RST WORKSHOP

SHERIDAN PARK CONFERENCE CENTRE, MISSISSAUGA - 25th OCTOBER, 1984

Person	Affiliation
Dr. David J. Lloyd	Alcan International Ltd
Dr. David M. Moore	"
Mr. E. H. McIntyre	Co-Steel International
Mr. C. Hyatt	McMaster University (Dept. of Metallurgy & Materials Science)
Mr. M.J.H. Ruscoe	Sherritt Gordon Mines Ltd
Mr. P.K. Jones	Stackpole Ltd
Mr. J. St. Pierre	
Dr. Clermont Roy	Universite de Sherbrooke Dept. of G. Mcanique
Prof. R. Smith	Queen's University Metallurgical Engineering Dept.
Mr. G. A. Jewett	Jewett and Associates
M. R. Roberge	Institute de Recherche d'Hydro Quebec
Mr. J. C. Laplante	Williams Gold Refining
Dr. Craig Simpson	Ontario Hydro
Mr. J. Kortschinski	" "
Dr. J. Masonuave	I.M.R.I.
Prof. Strom Olsen	McGill University
Mr. R. Lyall	Limpact Industries Ltd
Mr. M. Thibodeau	DRIE
Prof. R. Anger	Laval University
Mr. J. Farge	Noranda Research Centre
Mr. D. Herscovitch	"
Dr. K. Tandon	Manitoba Research Council
Dr. D.W.G. White	Energy, Mines & Resources, Canada
Dr. L. Collins	" " " "

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Dr. R. S. Hollingshead	Defence Research Establishment, Atlantic.
Mr. P. Midghall	Ontario Research Foundation
Mr. W. M. Gibbon	" " "
Dr. H. Shimizu	" " "
Mr. W. F. Fossen	" " "
Mr. P. J. Kenny	" " "
Dr. S. H. Lo	" " "
Mr. P. Girard	" " "
Dr. J. D. Sullivan	" " "
Mr. E. C. Brown	" " "
Dr. H. McAdie	" " "
Dr. W. Stott	" " "